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OP-044
Viral infections in pregnancy

Exploring the urinary metabolomic fingerprint of human cytomegalovirus: a 1H-NMR study on congenitally infected newborns

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AIM: Human cytomegalovirus (HCMV) is the leading cause of congenital infections resulting in severe morbidity and mortality among newborns worldwide. Nevertheless, little is known about the metabolic response triggered by HCMV in congenitally infected newborns. As such, urinary metabolic profiling by 1H-nuclear magnetic resonance (NMR) might represent a promising tool to be exploited in the context of cHCMV. This study aims to investigate the impact of HCMV infection on the urine metabolome in a population of newborns by 1H-NMR spectroscopy combined with multivariate statistical analysis.
METHODS: Thirty-five newborns diagnosed with cHCMV and fifteen uninfected controls were recruited. The 1H-NMR spectra of patients and controls allowed the identification of 55 metabolites.
RESULTS: Principal Component Analysis (PCA) and clustering correctly assigned 48 out of 50 newborns into the infected and control group. Partial least squares-discriminant analysis (PLS-DA) revealed that newborns with cHCMV resulted to have increased betaine, citrate, succinate, acetate, urea, galactose, glycolate, and formiate levels in the urine. On the other hand, healthy controls showed increased 1-methylnicotinamide, myoinositol, ethanolamine, glycine, taurine, fumarate, creatinin, and creatinin-phosphate levels. Specifically, succinate emerged as the discriminating metabolite in cHCMV newborns, whereas glycine and taurine were characteristic of healthy controls.
CONCLUSIONS: These results showed a clear difference in terms of metabolomic fingerprint between newborns with cHCMV infection and healthy controls. Thus, metabolomics can be considered a new promising diagnostic and prognostic tool in the clinical management of cHCMV patients.
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